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GB 1572413 A **EP 0414286 A1** **WO 95/12324 A1**
JP 008336361 A **US 4927660 A** **US 4761297 A**

(58) Field of Search
UK CL (Edition P) **A2B BKG BKP1 BKP9 BKX BMM19 BMR1 BSX , A2D DEF DRT , A2Q**
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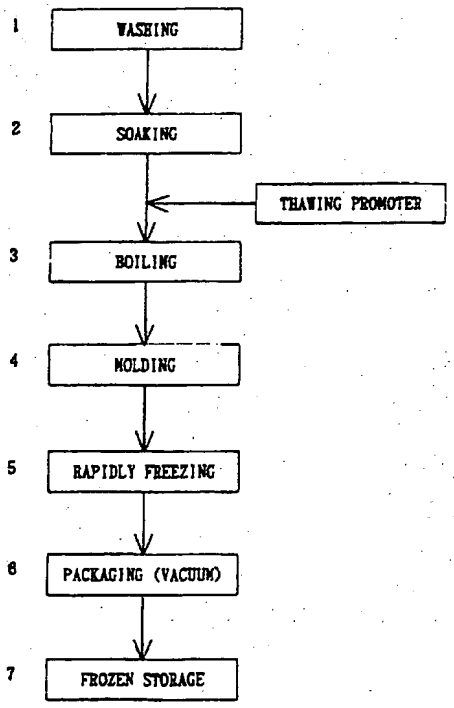
(54) Abstract Title
Frozen boiled rice or sushi with thawing additive

(57) So that frozen boiled rice or rice products can be thawed satisfactorily, a glucide of low sweetness is added to the rice before or after boiling. This increases the water holding capacity of the rice, so that it can be thawed even at 10 degrees C without crumbling or exhibiting the "white wax" phenomenon. The glucide may be a water soluble monosaccharide, oligosaccharide or polysaccharide, a glycoprotein, a glycolipid, a saccharic acid or an aminosugar. Examples are maltotetraose, sorbitol, trehalose, trehaose. Additional additives may include an alcohol (sake, rice spirit or ethanol), a protein hydrolysate (silk protein hydrolysate including dextrin, glycine, alanine, and serine), a vinegar (smoke solution, brewed vinegar) and an amino acid (glycine). The additives constitute at least 3% by weight of the uncooked rice. The rice is used to make sushi, unagi donburi, rice cakes, rice dumplings or ohagi.

FIG. 1



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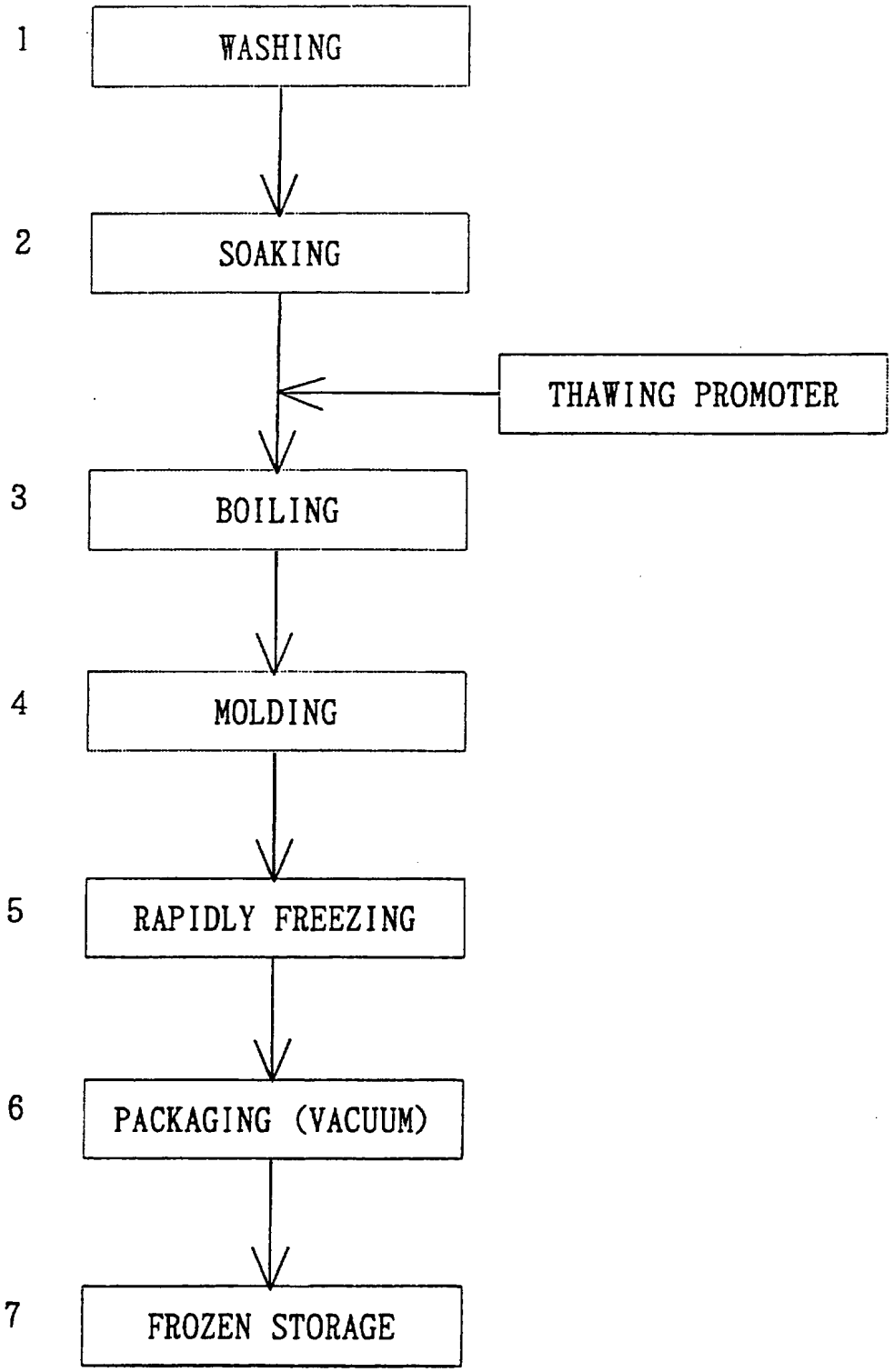
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

FIG. 1



FROZEN RICE WHICH CAN BE THAWED EVEN AT LOW TEMPERATURES OF 10℃ OR BELOW

BACKGROUND OF THE INVENTION

(1) Field of the Invention

This invention relates to frozen rice, specifically to a thawing promoter added to rice before the rice is frozen.

(2) Description of the Prior Art

In these days, a variety of frozen rice products have been developed and brought onto the market. These frozen rice products are thawed before eating, and most commercial frozen rice products need be thawed with heat. For example, frozen yaki-onigiri (grilled rice balls), fried rice, and pilaff are thawed by heating in a microwave oven or the like.

On the other hand, frozen sushi should be thawed at room temperature. This is because sushi is generally made with raw seafoods. Japanese Laid-Open Patent Application No. 4-94654 discloses a technique in which frozen rice is thawed at room temperature. This is enabled by adding salt to the rice during the production of the frozen rice.

However, there is a practical constraint for the above technique in that "room temperature" should be in a range of around 20-30℃. Accordingly, when a frozen rice product made with the above technique is thawed at 10℃, the rice is loose and crumbly. The phenomenon is called a "white wax" phenomenon. With

sticky, medium grain rice; such as Japanese rice, this represents a serious problem.

There are many areas in the world where the room temperature drops to 10℃ or below in winter time. In such an environment, stable thawing of the product can not be obtained unless it is thawed with a heating method, such as water thawing which uses flowing water, heat thawing in which the product is soaked in hot water, and microwave thawing in which the product is thawed by a microwave oven.

Under these circumstances, development of frozen rice that can be thawed in a stable manner at relatively low temperatures is desired so that a broader range of frozen products such as frozen sushi can be developed and brought onto the market.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a frozen rice product that can be thawed even at a temperature of 10℃ or below, that is, in a broader range of temperatures than conventional methods, in a stable manner without using water thawing, heat thawing, or microwave thawing and to provide a method of producing the frozen rice.

The above object of the present invention is fulfilled by adding a thawing promoter including a saccharide with low sweetness to rice before the rice is cooled.

Th[redacted]frozen rice made with th[redacted]method has a high water-holding capacity and can be thawed at a low temperature. This is because the saccharide taken into the rice increases the concentration of water-soluble molecules in the rice, increasing the osmotic pressure in the rice.

To thaw frozen products in a stable manner in a temperature as low as 10℃ or below, it is desirable that the thawing promoter includes a saccharide of 3% or more by weight of the uncooked rice.

The use of a saccharide with high sweetness will change the taste of the rice, so that the present invention adjust the sweetness of the saccharide to 50% or less that of saccharose.

Low-sweetness saccharides include, for example, Maltotetraose, Sorbitol, or Trehalose as the main ingredient. Any combination of these ingredients may also be used. Alternatively, Oligosaccharide may be added to such saccharides. These saccharides are effective in increasing the water-holding capacity.

It is desirable that an alcohol is added to the thawing promoter together with a saccharide. This increases the above effect of saccharide, prevents deterioration of the product while it is frozen, and stabilizes the thawing at low temperatures. A study shows that the use of an alcoholic drink such as a fermented drink (sake, synthetic sake, cooking sake, etc.) or a distilled liquor (shochu (distilled rice spirit), etc.) bears a satisfactory

result. Also, ethanol which is permitted as a food additive in Japan may be used.

Furthermore, it is desirable that any of the following are added to the thawing promoter: a protein hydrolysate such as a silk protein hydrolysate, a vinegar such as a smoke solution and a brewed vinegar, and a natural or synthetic amino acid, where the smoke solution is permitted as a food additive in Japan and is made by repeatedly distilling and refining pyrolignous acid.

Addition of such ingredients further improves the water-holding capacity or moisture-holding capacity to allow the thawed rice to be moist. Especially, a silk protein hydrolysate shows a prominent effect of improving the water-holding capacity or moisture-holding capacity.

It is desirable that the thawing promoter takes a form of a solution or an alcohol solution. Alternatively, the thawing promoter may be gelatinous, granular, powdered, or solid.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, advantages and features of the invention will become apparent from the following description thereof taken in conjunction with the accompanying drawings which illustrate a specific embodiment of the invention. In the drawings:

FIG.1 shows a procedure of producing the frozen rice described in the Embodiment of the present invention.

DESCRIPTION THE PREFERRED EMBODIMENT

FIG.1 shows a procedure of producing frozen rice as an embodiment of the present invention.

As shown in FIG.1, the frozen rice of the present invention is produced mainly with processes of: washing, soaking, boiling, molding, and rapidly freezing. In case of savory rice dishes, seasonings or ingredients may be added to the rice before or after boiling, or the rice may be further cooked after it is boiled. In case of a rice cake, a pounding process is performed after the rice is boiled or steamed. The frozen rices are wrapped, stored in a frozen state, and supplied to the consumers.

A thawing promoter is added to the rice in the above procedure, where the thawing promoter includes a saccharide with low sweetness as a main ingredient, and desirably includes an alcohol, a protein hydrolysate such as a silk protein hydrolysate, a vinegar, and an amino acid. The rice products made with this method have a high water-holding capacity and can be thawed in a stable manner even at a temperature of 10℃ or below. Also, the product retains water while it is frozen and thawed.

The following saccharides may be used in the present invention: a water-soluble monosaccharide, oligosaccharide, or polysaccharide; a glycoprotein; a glycolipid; a saccharic acid; and an aminosugar. To achieve a stable thawing at a temperature of 10℃ or below, it is necessary to add an amount of saccharide

which is 3% or more by weight of the uncooked rice to the thawing promoter.

Also, to preserve the taste of the rice, it is desirable to use a saccharide that is less sweet than that of Sorbitol which is itself 60-70% as sweet as saccharose. The saccharide needs to be 50% or less as sweet as saccharose.

Any mixture of the following commercial sugar products may be used:

* Tetrup: a syrup, made by Hayashibara Inc., which includes Maltotetraose as the main ingredient and is 20% as sweet as sugar.

* Sorbit: a D-sorbitol, made by Sanei-Touka Inc., which is 60-70% as sweet as saccharose.

* Sorpart: a D-sorbitol made by Ueno Seiyaku Inc.

* Trehaose: a crystal powder of a water crystal trehaose made from starch, made by Hayashibara Inc., which is 45% as sweet as sugar.

* Oligosaccharide: made by Sanwa Starch Industry Inc., which is 25% as sweet as sugar.

An alcohol may also be added to the rice. This increases, with a synergy between the saccharide and the alcohol, the penetration of the saccharide into the rice, increasing the thawing.

Kaya Silk Powder 21, developed by Kaya Sogo Shinko Inc., may be used as the silk protein hydrolysate. Kaya Silk Powder 21

includes dextrin (30%), glycine (23%), alanine (19%), and serine (7%).

As the amino acid, a natural or synthetic glycine may be used.

A smoke solution or a brewed vinegar may be used as the vinegar.

Adjustment of the amount of water is required when rice is boiled according to an absorption method, based on the freshness of the uncooked rice, the type of the rice cooker, or pressure. However, adding the above thawing promoter also shows an effect of boiling old rice as delicious as freshly harvested rice.

As shown in FIG.1, the frozen rice is immediately vacuum-packed. When stored in a freezer, the frozen rice products maintain their quality for a long period, not suffering from drying up or oxidizing.

Generally, as shown in FIG.1, the thawing promoter is added to soaked rice before the rice is boiled. However, the same effect may be obtained when the thawing promoter is added during the boiling process, or during a period between boiling and being cooled.

The ingredients of the thawing promoter may be mixed in advance before the thawing promoter is added to the rice. Alternatively, the ingredients may be added separately. The same effect may be gained in either way.

The present invention may be applied to a variety of frozen-rice products such as sushi, savory rice (rice seasoned with soy sauce and boiled with meat, seafood, and savory vegetables), and rice cake as well as to a plain boiled rice, though the effect of the present invention may be slightly different depending on the dish. That is, to thaw plain boiled rice, which has a relatively small Brix value since seasonings or ingredients are not added to it, the thawing temperature should be 10℃ or higher to secure a stable thawing. On the other hand, sushi and savory rice can be thawed in a stable manner at around 5-7℃ since sushi is made with vinegar and savory rice is made with several ingredients and soy sauce.

In case of rices seasoned with sugar in advance such as rice cakes, addition of a smaller amount of thawing promoter provides the same effect.

Experiment 1

Thawing promoter liquids I and II were made with the following ingredients.

(1) Ingredients for Thawing Promoter Liquid I :

smoke solution (Banyu Eiyo Inc.)	5g
Tetrup (Hayashibara Inc.)	105g
Sorbit (Sanei-Touka Inc.)	70g
Kaya Silk Powder 21 (Kaya town)	20g

sh[redacted]u (Kyowa Hakko Inc.: kou ty[redacted] 25% alcohol) 100g

synthetic sake (Godo Shusei Inc.) 100g

(2) Ingredients for Thawing Promoter Liquid II:

smoke solution (Banyu Eiyo Inc.)	5g
Tetrup (Hayashibara Inc.)	105g
Sorpart (Ueno Seiyaku Inc.)	70g
Kaya Silk Powder 21 (Kaya town)	20g
synthetic sake (Godo Shusei Inc.)	30g
glycine (Showa Denko Inc.)	12g
tap water	158g

Each of the above thawing promoter liquids I and II made for experiments had sweetness, which was contained in a mixture of Tetrup and Sorbit, being 50% or less that of saccharose.

The Brix values of thawing promoter liquids I and II were respectively 41% and 41.5%. The alcohol concentration of thawing promoter liquid II was less than 1%.

Each of thawing promoter liquids I and II may include a brewed vinegar instead of smoke solution. Compared with brewed vinegar, smoke solution equally improves the thawing, but is more antibacterial.

The following are the results of the experiments performed on (A) Saba Oshi-Sushi, (B) Unagi Donburi, (C) Rice for

Ohagi, (D) Ri[redacted]Cake, and (E) Rice Dumpli[redacted]for which thawing promoter liquid I and the respective ingredients shown below are used; and an experiment performed on (F) Sansai Savory rice using thawing promoter liquid II and the ingredients shown below.

(A) Saba Oshi-Sushi (molded sushi with mackerel)

rice (standard-grade rice)	4,000g
water	6,400g
Haimii	30g
(Ajinomoto Inc.: a seasoning including glutamic acid soda)	
Wafu-Dashi	10g
(Ajinomoto Inc.: a Japanese-style soup stock)	
salt	30g
vegetable oil (Nisshin Salad Oil Inc.)	20g
tangle	several pieces
thawing promoter liquid I	400g

In the above combination, thawing promoter liquid I is 10% by weight of the uncooked rice; the saccharide (Tetrup and Sorbit) in thawing promoter liquid I is 4.4% by weight of the uncooked rice.

The rice was boiled with the above ingredients, then 1,050g of sushi vinegar (product name: Marukan Su), which contains 30g of sugar, was added to the boiled rice and stirred to make sushi rice.

T[redacted] boiled rice was put into [redacted]old, then a piece of shime-saba (a piece of mackerel seasoned with salt and vinegar) was put on the rice in the mold, and a piece of saba oshi-sushi was made by pressing the rice and shime-saba into the mold. In this way, a plurality of pieces of saba oshi-sushi were made. For one piece of saba oshi-sushi, 280g of sushi rice and 200g of shime-saba were used.

The plurality of pieces of saba oshi-sushi were wrapped in cling film and cooled rapidly at -40℃ to make frozen saba oshi-sushi.

The plurality of pieces of frozen Saba Oshi-Sushi were stored for 48 hours in a frozen state and were then thawed at 7℃. The result was favorable. That is, the thawed rice was moist, not loose, with the same texture and the same flavor as before freezing.

The above experiment (A) was repeated using other ingredients, such as trout, eel, and salmon, and also repeated for other kinds of sushi, such as nigiri sushi (hand-molded fish on rice), inari sushi (rice in a fried tofu pocket), chirashi sushi (sweet vegetable rice), and maki sushi (rolled sushi). These various types of sushi were frozen with the present method and thawed at 7℃. The results were equally favorable.

The above frozen pieces of sushi were also thawed using the "raw material thawing function" of a microwave oven whose rated very-high-frequency output is about 500W. The result was

equally satisfactory.

(B) Unagi Donburi (grilled eel served on rice)

rice (standard-grade rice)	4,000g
water	6,400g
salt	40g
vegetable oil (Nisshin Inc.)	40g
thawing promoter liquid I	400g

The rice was boiled with the above ingredients, and then mixed with a sauce (a home-made sauce made of soy sauce, sugar, and sweet sake) 800g to make a sauce rice. The sauce rice was packaged.

The sauce rice was put into containers, and two pieces of eel were put on the rice in each container. This was then cooled rapidly at -40℃ to make a plurality of frozen Unagi Donburi's.

The frozen Unagi Donburi's were stored for 48 hours in a frozen state, and were then thawed in groups respectively at 25℃ (room temperature), at 5℃ in a refrigerator, and at 7℃ in a refrigerator.

In room temperature, the frozen Unagi Donburi's were completely thawed in less than one hour, and the quality and taste of the dish were satisfactory.

The rice of the frozen Unagi Donburi's thawed in 5℃ and

7℃ had a favorable texture even while the thawing was not complete, that is, even when ice crystals remained. The white wax phenomenon was not observed in the thawed rice.

(C) Rice for Ohagi (a rice ball wrapped by sweet bean paste)

rice (breed name: Koshihikari)	2,000g
glutinous rice	2,000g
water	6,400g
salt	20g
sugar	200g
thawing promoter liquid I	400g

In the above combination, thawing promoter liquid I is 4.4% by weight of the uncooked rice; sugar is 5% by weight of the uncooked rice; and the combination of them is 9.4% by weight of the uncooked rice.

The rice was boiled with the above ingredients and then a plurality of rice balls for ohagi were made, with each rice ball being 70g. The plurality of rice balls for ohagi were cooled rapidly at -40℃.

The plurality of frozen rice balls for ohagi were stored for 48 hours in a frozen state, and were then thawed at a room temperature of 7℃. The result was favorable and rice did not suffer from drying during the freezing process.

(D) Rice Cake

Uncooked rice-cake rice 4,000g was soaked in water for 6 hours, removed from water, then steamed for 20 minutes by a small-scale low-pressure boiler. The steamed rice was pounded by a domestic rice cake maker to make a rice cake, with the following ingredients added to the rice.

thawing promoter liquid I	40g
viscosity-increasing polysaccharide (product name: mochiron)	40g
sugar	60g
salt	40g
tap water	1,000g

The pounded rice cake was stretched out and divided into a plurality of small rice cakes respectively in groups of 1cm, 3cm, and 10cm in thickness. These were left to stand for a while. The plurality of rice cakes were then cooled rapidly at -40℃ and stored for 10 days in a frozen state. They were then thawed at a room temperature of 5℃. No cracks or hollows were observed in the thawed rice cakes, and the state of the rice cakes was the same as that immediately after pounding. Furthermore, the rice cakes did not harden even two or three days after thawing.

It is possible to use yam starch instead of the viscosity-increasing polysaccharide. Also, the above method may

be applied [redacted] cooked rice cakes, such a[redacted]rice cakes with soy sauce, seaweed, or sweet bean paste. Tests confirmed that the same effects were achieved.

(E) Rice Dumpling

Two kilograms of uncooked rice (standard-grade rice or Koshihikari) was washed, soaked in water for one hour, removed from the water, and then steamed for 25 minutes by a small-scale low-pressure boiler. The steamed rice was kneaded by a rice cake kneading machine to make a rice dumpling dough. The rice dumpling dough was soaked in water then kneaded again by a rice cake kneading machine with the following ingredients added to the rice dumpling dough.

thawing promoter liquid I	20g
viscosity-increasing polysaccharide (or yam starch)	20g
sugar	30g
salt	20g

The kneaded rice dumpling dough was formed into a plurality of rice dumplings by an automatic dumpling forming machine, and cooled rapidly in -40℃ in a rapid cooler. The frozen rice dumplings were vacuum-packed and stored for several months in a freezer in a frozen state. When thawed in 5℃, the rice dumplings were as soft as immediately after they were

kneaded.

It should be noted here that the above method is applicable to cooked rice dumplings such as the rice dumplings with sweet bean paste or sweet sesame paste to obtain the same effects.

(F) Sansai Savory Rice (savory rice with edible wild plants)

rice (standard-grade rice)	3,600g
rice-cake rice	400g
water	6,000g
soy sauce (Kikkoman Inc.)	240g
wild plants ("Sansai Mix" by Kaneka Inc.)	2,000g
carrots (large)	2
fried tofu	2 sheets
Honteri	200g
(Mitsukan Inc.: a seasoning including sweet sake)	
Haimii	20g
Dashi-no-Moto	40g
(Shimaya Inc.: a seasoning including dried bonito)	
salt	20g
thawing promoter liquid II	400g

The rice was boiled with the above ingredients and cooled rapidly at -40℃ to make frozen sansai savory rice. After a 48-hour storage in a frozen state, it was thawed at 5℃ in a

refrigerator. The thawed rice was in a favorable state and no wax phenomenon was observed.

Comparative Experiments

For comparison, the above products; (A) Saba Oshi-Sushi, (B) Unagi Donburi, (C) Rice for Ohagi, (D) Rice Cake, (E) Rice Dumpling, and (F) Sansai Savory rice were made in the same way without either of the thawing promoter liquids I or II.

The rice in the thawed comparative products; (A), (B), and (F) was considerably crumbly. The thawed comparative products; (C), (D), and (E) were a little loose and looser than the corresponding ones made using the thawing promoter liquid.

It should be noted here that thawing promoter liquids I and II may also be used for watery foods such as creme caramel to improve the water-holding capacity.

Antimicrobial Action Evaluation Test

An evaluation test was performed on thawing promoter liquid I in terms of the antimicrobial action which is a secondary effect of the liquid. This evaluation test was conducted on an undilluted solution and a dilute solution in which the ratio of the undilluted solution to ion-exchanged water is 1:9.

10ml of each of the two test solutions (the control solution and the dilute solution) was inoculated with a bacteria

liquid 0.1ml (about 10^9 CFU/ml). The strain used in this test was Escherichia coli (ESC).

The number of existent bacterium in the inoculated test material solutions was measured one hour after the inoculation. The initial number of bacterium was measured on a buffer solution (1/15, 7.2pH) 10ml which had been inoculated with a bacteria liquid 0.1ml.

The test results are as follows.

	INITIAL	1 HOUR LATER
UNDILUTED SOLUTION	1.6×10^5	6.2×10^4
DILUTE SOLUTION (1/10)	1.6×10^5	1.1×10^5

(unit: CFU/ml)

As apparent from the test results, thawing promoter liquid I shows a remarkable antimicrobial action. This antimicrobial action is effective for most perishable foods, as well as for boiled rice.

Ethanol, which is designated as a food additive, was mixed with thawing promoter liquid I at a ratio of 9:1, and was sprayed on a sushi main ingredient (such as raw fish) that had previously been frozen and thawed. The sushi ingredient after re-freezing and re-thawing was soft and moist, with little loss of retained water. The same solution of ethanol and thawing promoter liquid I was sprayed on several pieces of raw tuna. The raw tuna maintained its freshness and color even after quite lengthy period of storage in a freezer at about -20℃. The same solution was

sprayed on [redacted] mixture of raw tuna and [redacted] ing onion. It was confirmed that the mixture of raw tuna and spring onion maintained its freshness and color for over 6 months in a freezer at about -20℃. The same solution was sprayed on chopped cabbage. No corruption or decomposition was not observed in the cabbage after over 10 days in a refrigerator at 5-8℃.

Experiment 2

Thawing promoter liquid III was made with the following ingredients.

Tetrup (Hayashibara Inc.)	60g
Sorpart (Ueno Seiyaku Inc.)	40g
shochu (Godo Shusei Inc.: kou type, 25% alcohol)	100g

The Brix value of thawing promoter liquid III was 41%.

(G) Matsutake Mushroom Rice

rice (standard-grade rice)	1,600g
rice-cake rice	400g
water	3,500g
Matsutake Gohan-no-Moto (Riken Vitamin Inc.: a seasoning flavored with matsutake mushroom)	1,000g
Dashi-no-Moto (Shimaya Inc.)	20g
thawing promoter liquid III	200g

The rice was boiled with the above ingredients to make matsutake mushroom rice. The matsutake mushroom rice was packaged into 300g-bags. The packaged matsutake mushroom rice was rapidly frozen in a rapid freezer at -40℃ and was stored in a frozen state for 48 hours, and was thawed in refrigerators respectively at 5℃ and 7℃. The rice of the thawed matsutake mushroom rice had a favorable texture even while the thawing was not complete, that is, even when ice crystals remained. Also, the white wax phenomenon was not observed in the thawed rice.

For comparison, matsutake mushroom rice was made with the same procedure without thawing promoter liquid III. The white wax phenomenon was observed in the comparative matsutake mushroom rice when it was frozen and thawed in the same way as the above example.

Experiment 3

Thawing promoter liquid IV was made with the following ingredients.

Tetrup (Hayashibara Inc.)	75g
Trehaose (Hayashibara Inc.)	27g
tap water	98g

The Brix value of thawing promoter liquid IV was 41%.

(H) Sushi Rice

rice (standard-grade rice)	2,000g
water	3,500g
salt	20g
vegetable oil	15g
thawing promoter liquid Ⅳ	200g

The rice was boiled with the above ingredients. The boiled rice was mixed with a sushi vinegar, at a ratio of 1000g to 110g, to make sushi rice. The sushi rice was packaged into 300g bags and rapidly frozen in a rapid freezer at -40℃.

The packed sushi rice was stored in a frozen state for 48 hours, and was thawed overnight in a refrigerator at 5℃. The thawed sushi rice was as good as normal. No white wax phenomenon was observed.

For comparison, sushi rice was made with the same procedure without thawing promoter liquid Ⅳ. The white wax phenomenon was observed in the comparative sushi rice when it was frozen and thawed in the same way as the above example.

Although the present invention has been fully described by way of examples with reference to the accompanying drawings, it is to be noted that various changes and modifications will be apparent to those skilled in the art. Therefore, unless such changes and modifications depart from the scope of the present invention, they should be construed as being included therein.

What is claimed is:

1. A thawing promoter for promoting thawing of frozen rice, wherein the thawing promoter is added to rice during a process of producing the frozen rice, the frozen rice being produced by boiling uncooked rice and freezing boiled rice, wherein

the thawing promoter includes a glucide which is 50% or less as sweet as saccharose.

2. The thawing promoter of Claim 1, wherein

the glucide includes at least one of a water-soluble monosaccharide, a water-soluble oligosaccharide, and a water-soluble polysaccharide.

3. The thawing promoter of Claim 2, wherein

the glucide includes at least one of Maltotetraose, Sorbitol, and Trehalose.

4. The thawing promoter of Claim 1 further including at least one of an alcohol, a protein hydrolysate, a vinegar, and an amino acid.

5. The thawing promoter of Claim 4, wherein

the alcohol is one of a fermented alcoholic drink, a distilled liquor, and an ethanol permitted as a food additive.

6. The thawing promoter of Claim 4, wherein

the protein hydrolysate is a silk protein hydrolysate.

7. The thawing promoter of Claim 4, wherein

the vinegar includes one of a smoke solution and a brewed vinegar.

8. The thawing promoter of Claim 4, wherein

the amino acid includes one of a natural amino acid and a synthetic amino acid.

9. The thawing promoter of Claim 4 including a mixture of the glucide and at least one of the alcohol, the protein hydrolysate, the vinegar, and the amino acid.

10. The thawing promoter of Claim 4 being one of gelatinous, granular, powdered, and solid.

11. A thawing promoter for promoting thawing of frozen rice, wherein the thawing promoter is added to rice during a process of producing the frozen rice, the frozen rice being produced by boiling uncooked rice and freezing boiled rice, wherein

the thawing promoter includes a glucide as a main ingredient and further includes at least one of an alcohol, a

protein hydrolysate, a vinegar, and an amino acid.

12. A method of producing frozen rice, the method comprising:

a boiling step of boiling uncooked rice to make rice;

an adding step of adding a glucide which is 50% or less as sweet as saccharose to one of the uncooked rice and the boiled rice; and

a freezing step of freezing the boiled rice.

13. The method of Claim 12, wherein

the glucide in the adding step is 3% or more by weight of the uncooked rice.

14 The method of Claim 13, wherein

the glucide includes at least one of Maltotetraose, Sorbitol, and Trehalose.

15. The method of Claim 12, wherein

in the adding step, at least one of an alcohol, a protein hydrolysate, a vinegar, and an amino acid is further added to the uncooked rice.

The Patent Office

Application No:	GB 9801925.0	**Examiner:**	Bridie Collier
Claims searched:	1-15	**Date of search:**	22 April 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): A2D (DRT, DEF), A2B (BSX, BKG, BKP1, BKP9, BKX, BMR1, BMM19), A2Q

Int Cl (Ed.6): A23L 1/182, 3/365; A23B 4/07, 9/10, 9/12

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 1572413 A	(NAGATANIEN) See example 2	1,11,12 at least
X	EP 0414286 A1	(UNILEVER) See whole document	1-15
X	WO 95/12324 A1	(MAYEKAWA) See Page 24 line 22 and Page 4 line 17	1,11,12 at least
A	US 4927660 A	(SANO) See col 4 line 17	
A	US 4761297 A	(HOUSE) See col 3 lines 15-16, and col 1	
X	JP 08336361 A	(URASHIMA) See abstract	1-15

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.